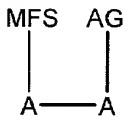
CLAIMS

We claim:

1. A composition comprising a metallic surface and an asymmetric monolayer forming species having the formula:



wherein

A is an attachment linker moiety selected from the group comprising sulfur and phosphonate;

MFS is a monolayer forming species comprising conductive oligomers and insulators; and

AG is an electroconduit forming species.

2. A composition according to claim 1 wherein A is sulfur.

3. A composition according to claim 1 wherein said metallic surface is gold.

4. A composition according to claim 1 wherein said MFS is an insulator.

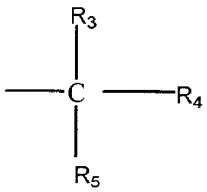
5. A composition according to claim 4 wherein said insulator comprises an alkyl group from about 7 to 20 carbons.

6. A composition according to claim 5 wherein said alkyl group comprises a heteroalkyl.

7. A composition according to claim 5 wherein said alkyl group comprises a substituted alkyl.

8. A composition according to claim 1 wherein said AG comprises an alkyl group from about 1 to 6 carbons.

9. A composition according to claim 1 or 8 wherein said AG is branched, having the formula:



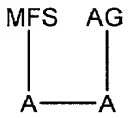
wherein

R_3 through R_5 are independently selected from the group consisting of hydrogen, alkyl, aryl, alcohol, amine, amido, nitro, ether, ester, ketone, imino, aldehyde, alkoxy, carbonyl, halogen, sulfur containing moiety and phosphorus containing moiety;

10. A composition according to claim 9 wherein said AG is attached to said attachment linker via a $(CH_2)_n$ group, wherein n is an integer from 0 to 4.

11. A composition according to claim 9 wherein said AG is attached directly to said attachment linker.

12. A method of modifying a metallic surface comprising contacting the metallic surface with an asymmetric monolayer forming species having the formula:



wherein
A is an attachment linker moiety;
MFS is a monlayer forming species; and
AG is an electroconduit forming species.

13. A method according to claim 12 further comprising contacting said metallic surface with a biological species having the formula:

A-MFS-capture binding ligand

wherein
A is an attachment linker; and
MFS is a monolayer forming species.

14. A method according to claim 13 wherein said capture binding ligand is a nucleic acid.

15. A method according to claim 13 wherein said capture binding ligand is a n protein.

16. A method according to claim 12 wherein A is sulfur.

17. A method according to claim 12 wherein said metallic surface is gold.

18. A method according to claim 12 wherein said MFS is an insulator.

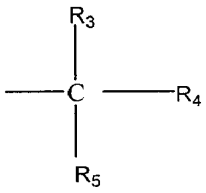
19. A method according to claim 18 wherein said insulator comprises an alkyl group from about 7 to 20 carbons.

20. A method according to claim 19 wherein said alkyl group comprises a heteroalkyl.

21. A method according to claim 19 wherein said alkyl group comprises a substituted alkyl.

22. A method according to claim 12 wherein said AG comprises an alkyl group from about 1 to 6 carbons.

23. A method according to claim 12 or 22 wherein said AG is branched, having the formula:



wherein

R_3 through R_5 are independently selected from the group consisting of hydrogen, alkyl, aryl, alcohol, amine, amido, nitro, ether, ester, ketone, imino, aldehyde, alkoxy, carbonyl, halogen, sulfur containing moiety and phosphorus containing moiety;

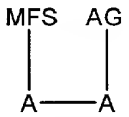
24. A method according to claim 23 wherein said AG is attached to said attachment linker via a $(CH_2)_n$ group, wherein n is an integer from 0 to 4.

25. A method according to claim 23 wherein said AG is attached directly to said attachment linker.

26. A method of detecting a target analyte in a sample comprising:

a) binding said target analyte to a metallic surface comprising

i) an asymmetric monolayer forming species having the formula:



ii) a species having the formula A-MFS-capture binding ligand; and

wherein

A is an attachment linker moiety;
MFS is a monolayer forming species; and
AG is an electroconduit forming species; and
b) binding a solution binding ligand to said target analyte, wherein said solution binding ligand comprises a first portion that will bind to said target analyte and a recruitment linker comprising a first portion comprising at least one ETM; and
c) detecting the presence of said ETM as an indication of the presence of the target analyte.

27. A method according to claim 26 wherein said recruitment linker is directly attached to said target analyte.

28. A method according to claim 26 wherein said recruitment linker is indirectly attached to said target analyte.

29. A method according to claim 26 wherein said ETM is a transition metal complex.

30. A method according to claim 26 wherein said ETM is metallocene.

31. A method according to claim 26 wherein said ETM is ferrocene.

32. A method according to claim 26 wherein said ETM is an organic electron transfer moiety.

33. A method according to claim 26 wherein said capture binding ligand is a nucleic acid.

34. A method according to claim 26 wherein said capture binding ligand is a protein.

35. A method according to claim 26 wherein A is sulfur.

36. A method according to claim 26 wherein said metallic surface is gold.

37. A method according to claim 26 wherein said MFS is an insulator.

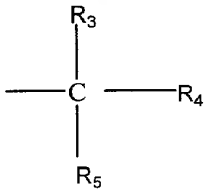
38. A method according to claim 37 wherein said insulator comprises an alkyl group from about 7 to 20 carbons.

39. A method according to claim 38 wherein said alkyl group comprises a heteroalkyl.

40. A method according to claim 38 wherein said alkyl group comprises a substituted alkyl.

41. A method according to claim 26 wherein said AG comprises an alkyl group from about 1 to 6 carbons.

42. A method according to claim 26 wherein said AG is branched, having the formula:



wherein

R_3 through R_5 is selected from the group consisting of hydrogen, alkyl, aryl, alcohol, amine, amido, nitro, ether, ester, ketone, imino, aldehyde, alkoxy, carbonyl, halogen, sulfur containing moiety and phosphorus containing moiety;

43. A method according to claim 26 wherein said AG is attached to said attachment linker via a $(CH_2)_n$ group, wherein n is an integer from 0 to 4.

44. A method according to claim 26 wherein said AG is attached directly to said attachment linker.